Washington State Department of Health
ELABORATIONS
News and Issues for Washington's Clinical Laboratories

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Antibiotic-Resistant Organism Updates 2022

The Washington State Department of Health performs surveillance for highly antibiotic resistant organisms. Some of these isolate-types are mandated to be submitted statewide, and some are requested to be submitted by sentinel labs on a voluntary basis. This article describes updates to surveillance for antibiotic resistant organisms, as of October 2021.

Since 2016, the Washington State Department of Health Public Health Laboratories (WA PHL) has served as the Antibiotic Resistance (AR) Laboratory for the western US. The AR Lab Network is funded by Centers for Disease Control and Prevention (CDC) and performs multidrug resistant organism (MDRO) surveillance and advanced antibiotic resistance testing. Isolates submitted by clinical labs to the AR Lab Network West Regional Laboratory undergo identification, mechanism testing, and susceptibility testing.

The AR Lab performs the following antibiotic resistance testing on isolates and samples. (Table 1 on page 3)

SURVEILLANCE UPDATES

1. **Changes to the list of notifiable conditions are going into effect January 2022**

- Washington Administrative Code (WAC) 246-101 dictates which conditions are notifiable (must be reported to public health). WAC revisions go into effect January 1, 2022. *Candida auris* and Carbapenem-resistant *E.coli*, *Enterobacter* spp., and *Klebsiella* spp. have been added to the list of notifiable conditions and will be mandated to be reported, whereas until now, all reporting and submission has been voluntary. Please review revisions to the list of notifiable conditions, as well as report to public health and forward isolates, as required.

2. **In 2021, the AR Lab Network West Regional Laboratory added Whole Genome Sequencing (WGS) of carbapenemase-producing (CPO) and carbapenemase resistant organisms (CRO).**

- At the direction of CDC, the Washington State Public Health lab began routinely sequencing eligible CPO and CRO isolates.
- Eligible isolates include:

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Practice Guidelines

The following practice guidelines have been developed by the Clinical Laboratory Advisory Council. They can be accessed at the LQA website.

Acute Diarrhea
Anemia
ANA
Bioterrorism Event Mgmt
Bleeding Disorders
Chlamydia
Diabetes
Group A Strep Pharyngitis
Group B Streptococcus
Hepatitis
HIV
Infectious Diarrhea
Intestinal Parasites
Lipid Screening
PAP Smear Referral
Point-of-Care Testing
PSA
Rash Illness
Red Cell Transfusion
Renal Disease
STD
Thyroid
Tuberculosis
Urinalysis
Wellness

Antibiotic-Resistant Organism Updates 2022 (cont'd)

- PCR negative and mCIM positive isolates, results that indicate the potential for novel resistance mechanisms (excluding some Serratia and Enterobacter isolates)
- Carbapenemase-producing CRAB
- CRAB isolates resistant to all beta-lactam or all carbapenem drugs tested
- Carbapenemase-producing CRPA
- Carbapenemase-producing CRE (excluding those which produce KPC)
- All eligible isolates are sequenced, there is no need to request sequencing
- Analysis of the sequences to assess relatedness is performed by CDC if the epidemiologic investigation suggests transmission
- For more information please contact ARLN@doh.wa.gov

3. The ARLN test menu has recently been updated and should be used to access specimen collection and submission instructions and forms for all multidrug resistant organism testing (except tuberculosis). The ARLN test menu is an important resource for all clinical laboratories.

4. CDC recommends that healthcare providers consider creening for:

- Carbapenemase-producing organisms in hospitalized patients who have been hospitalized in a foreign country within the prior 6 months
- *Candida auris* colonization in:
- Hospitalized patients who have been hospitalized in a region (internationally and nationally) with documented *Candida auris* transmission (for global and US transmission).
- Any patient with a non-KPC carbapenemase
- *Candida auris* and carbapenemase-producing organism colonization in patients who have had healthcare contact with known cases.

Please contact your local health jurisdiction (LHJ) to arrange colonization screening.

5. **Expanded Antimicrobial Susceptibility Testing for Hard-to-Treat Infections (ExAST) has been available at WA PHL since 2020.Healthcare providers and clinical laboratories can request ExAST to determine effectiveness of new-to-market antibiotics for treating infections caused by metallo-β-lactamase (MBL)-producing Enterobacterales.**

- Eligible isolates undergo standard testing (see Table 1, page 3), as well as susceptibility testing for ceftazidime/avibactam, aztreonam, and aztreonam/avibactam.
- Eligible isolates include Enterobacterales that:
- Test non-susceptible to all beta-lactams, including either ceftazidime/avibactam or meropenem/vaborbactam (these isolates may be MBL-producing isolates with few effective treatment options)

OR

- Possess MBL genes (NDM, VIM, or IMP) confirmed by molecular test
- Turn-around-time is 3 business days
- Pre-approval is required, please contact ARLN@doh.wa.gov.

6. CDC recommends that clinical laboratories speciate

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Antibiotic-Resistant Organism Updates 2022 (cont'd)

all *Candida* isolates from invasive infections, and all *Candida* isolates from patients hospitalized in an area with sustained *C. auris* transmission (see #4 above for details).

7. Several automated identification methods can misidentify *C. auris* as other rare *Candida* species. See Table 2 on page 4 for identification methods and *Candida* species that should be **suspected as *C. auris* and submitted to PHL for confirmatory testing**. Please identify the fungal identification method used in your lab and educate lab personnel re garding *Candida* species that should raise concern for *C. auris*.

SURVEILLANCE REMINDERS

All Washington labs should submit the following isolate-types to PHL:
- Carbapenem-resistant *E. coli, Klebsiella* species, and *Enterobacter* species
- Suspected or confirmed *Candida auris* isolates
- Carbapenem-resistant *Acinetobacter* species

In addition to submitting the isolate-types above, volunteer **sentinel labs (and other interested labs) are encouraged to submit one or more of the following isolate-types to PHL:**
- Carbapenem-resistant *Pseudomonas aeruginosa*
- Carbapenem-resistant *Citrobacter* species
- Carbapenem-resistant *Morganella, Proteus* and *Providencia* species (Note: These genera have intrinsic resistance to imipenem. Only submit those that are resistant to another carbapenem in addition to imipenem.)
- All *Candida* species EXCEPT *albicans*

Please contact ARLN@doh.wa.gov if your laboratory is interesting in becoming a sentinel laboratory.
Table 3 on page 5 summarizes species and resistance criteria for laboratories submitting isolates for MDRO surveillance.
We thank laboratories for their diligence in reporting and submitting antibiotic-resistant organisms to public health. The ARLN will cover shipping costs associated with MDRO submission upon request. Please contact ARLN@doh.wa.gov if you are interested in sentinel laboratory participation or if you have any questions/concerns regarding testing or shipping. Contact Kelly Kauber at kelly.kauber@DOH.wa.gov or by phone at 206-418-5500 for questions about admission- or surveillance-screening.

Table 1: Isolates or Samples Solicited at Washington Antibiotic Resistance Lab and Testing Performed

Isolate/Sample Type	Testing Performed
Carbapenem-resistant Enterobacterales (CRE)	• Species identification (ID) • Mechanism testing • Antibiotic susceptibility testing (AST)
Carbapenem-resistant *Acinetobacter baumannii* (CRAB)	• Species ID • Mechanism testing • AST
Carbapenem-resistant *Pseudomonas aeruginosa* (CRPA)	• Species ID • Mechanism testing • AST
Non-*albicans Candida* species	• Species ID • Antifungal susceptibility testing (AFST)
Carbapenemase-producing organism (CPO) colonization screening sample	• Mechanism testing • Species ID (only if a carbapenemase is detected)
Candida auris colonization screening sample	• *Candida auris* ID • AFST, by request only
Targeted surveillance colonization screening sample (i.e. culture-based screening for OXA-23, OXA-24/40, and OXA-58 in CRAB)	• Species ID • Mechanism testing

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Table 2. When to Suspect *Candida auris*

Identification Method	Organisms *C. auris* can be misidentified as
Vitek 2YST*	*Candida haemulonii* *Candida duobushhaemulonii*
API 20C	*Rhodotorua glutinis* (characteristic red color not present) *Candida sake*
API ID 32C	*Candida intermedia* *Candida sake* *Saccaromyces kluyveri*
BD Phoenix yeast Identification system	*Candida haemulonii* *Candida catenulata*
MicroScan	*Candida famata* *Candida guilliermondii*** *Candida lusitaniae*** *Candida parapsilosis***
RapID Yeast Plus	*Candida parapsilosis*

Table 2 is reproduced from CDC.

*There have been reports of *C. auris* being misidentified as *Candida lusitaniae* and *Candida famata* on VITEK 2. A confirmatory test, such as cornmeal agar, may be warranted for these species.

***C.guilliermondii, C. lustianiae*, and *C. parapsilosis* generally make pseudohyphae on cornmeal agar. If hyphae or pseudohyphae are not present on cornmeal agar, this should raise suspicion for *C. auris* as *C. auris* typically does not make hyphae or pseudohyphae. However, some *C. auris* isolates have formed hyphae or pseudohyphae. Therefore, it would be prudent to consider any *C. guilliermondii, C. lusitaniae*, and *C. parapsilosis* isolates identified on MicroScan or any *C. parapsilosis* isolates identified on RapID Yeast Plus as possible *C. auris* isolates and forward them for further identification.

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Table 3. Species, Resistance Criteria, and Submitters for Washington State MDRO Surveillance

Family or Genus	Antibiotic Resistance Criteria	Submitters
CR-Enterobacterales: *E. coli* *Klebsiella* spp. *Enterobacter* spp.	Resistant to ≥1 carbapenem: Minimum inhibitory concentrations MIC ≥4 mcg/ml for meropenem, imipenem, and doripenem, and ≥2 mcg/ml for ertapenem **OR** Kirby-Bauer zone of inhibition diameter ZID ≤19 mm for meropenem, imipenem, and doripenem, and ≤18 mm for ertapenem	All labs
CR-Acinetobacter spp.	Resistant to ≥1 carbapenem: MIC ≥8 µg/ml for any carbapenem **OR** Kirby-Bauer ZID ≤14 mm for doripenem and meropenem, and ≤18 mm for imipenem	All labs
Candida auris (suspected or confirmed)	None	All labs
All *Candida* spp. EXCEPT *albicans*[1]	None	Sentinel labs
CR-*Pseudomonas aeruginosa* spp.[1] (non-mucoid)	Resistant to ≥1 carbapenem excluding ertapenem: MIC ≥8 µg/ml for any carbapenem **OR** Kirby-Bauer ZID diameter ≤15 mm for any carbapenem **AND** Non-susceptible or resistant (I or R) to ceftazidime (MIC ≥16 µg/ml or Kirby-Bauer ZID ≤ 17 mm) and cefepime (MIC ≥16 µg/ml or Kirby-Bauer ZID ≤ 17 mm	Sentinel labs[2]
Carbapenem-resistant *Citrobacter* spp.	Resistant to ≥1 carbapenem: MIC ≥4 µg/ml for meropenem, imipenem, and doripenem, and ≥ 2 µg/ml for ertapenem **OR** Kirby-Bauer ZID ≤19 mm for meropenem, imipenem and doripenem, and ≤18 mm for ertapenem	Sentinel labs[2]
Carbapenem-resistant *Morganella, Proteus and Providencia* spp. [3]	Resistant to ≥ 1carbapenem ***in addition to imipenem***: MIC ≥4 µg/ml for meropenem and doripenem, and ≥ 2 µg/ml for ertapenem **OR** Kirby-Bauer ZID ≤19 mm for meropenem and doripenem, and ≤18 mm for ertapenem	Sentinel labs[2]

[1]If the number of each isolate-type for submission is too burdensome, sentinel labs may submit only a subset.

[2]All labs are encouraged to submit these isolate types but are not required to do so.

[3]Note: These genera may have intrinsic resistance to imipenem. Only those that are resistant to a carbapenem other than imipenem should be submitted.

Calendar of Events

Training Classes:

2022 Virtual Joint Spring Seminar
April 20-22

2022 NWMLS
October (dates TBD)

2022 Clinical Laboratory Conference
November (dates TBD)

Contact information for the events listed above can be found on page 2. The Calendar of Events is a list of upcoming conferences, deadlines, and other dates of interest to the clinical laboratory community. If you have events that you would like to have included, please mail them to ELABORATIONS at the address on page 2. Information must be received at least one month before the scheduled event. The editor reserves the right to make final decisions on inclusion.

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